Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band	)	ET Docket No. 98-237

COMMENTS OF HUGHES COMMUNICATIONS, INC.
AND PETITION FOR RECONSIDERATION

Hughes Communications, Inc. ("HCI") hereby submits its Comments on the December 18, 1998 NPRM in this proceeding and requests reconsideration of the December 18, 1998 Order that has frozen the acceptance of satellite earth station applications at 3600-3700 MHz. HCI urges the Commission to expand this proceeding to take into account the established need to designate spectrum in the 3600-3700 MHz band (space-to-Earth) for TT&C functions of space stations operating in bands other than the C band and the Ku band.

In August, 1997, nine satellite companies, who represent a broad segment of the U.S. satellite industry,[1] filed a Petition for Rulemaking (the "TT&C Petition"), requesting that the Commission designate 10 MHz of extended C band spectrum in the 3600-3700 MHz (space-to-earth) and 6425-6525 MHz (earth-to-space) bands for tracking, telemetry and command

[1] Lockheed Martin; Comm, Inc. (Motorola); EchoStar Satellite Corp.; GE American Communications, Inc.; Hughes Communications Galaxy, Inc.; KaStar Satellite Communications Corp.; Orion Network Systems, Inc. (now Loral Orion); PanAmSat Licensee Corp.; and VisionStar, Inc.

(TT&C) operations of GSO FSS systems operating in higher frequency bands (above Ku band).[2] The TT&C Petition was filed after consultations with Commission staff, and responded to the well-recognized problem that currently-licensed Ka band satellite systems, and proposed Ka and V band satellite systems, need to be able to use lower frequency bands (such as 3600-3700 MHz) for critical spacecraft operations, including launch-related transfer orbit functions, and emergency on-orbit maneuvers.[3]

Among other things, the TT&C Petition responded to the fact that (i) the use of Ka band frequencies for TT&C functions would impose severe operational, technical and economic constraints on licensed GSO Ka band systems, and (ii) the Commission has uniformly rejected various proposals of Ka band applicants to use "standard" C band or Ku band frequencies for transfer orbit TT&C.[4] In fact, based on these considerations, HCI has proposed

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[2] A copy of the TT&C Petition is attached as Annex A and incorporated herein by reference.

[3] Significantly, the TT&C Petition did not propose any material change in the Table of Frequency Allocations (a primary non-government FSS allocation currently exists at 3600-3700 MHz). The TT&C Petition recognized, however, that Footnote US245, which limits use of the band to international, inter-continental systems, would need to be clarified or waived to permit such limited TT&C functions. TT&C Petition at 5-6.

[4] *See* Ka-band authorizations of Comm, Inc. (File Nos. 163 through 166-SAT-P/LA-95, 201-SAT-MISC-95, rel. May 9, 1997), EchoStar Satellite Corp. (File Nos. 167 and 168-SAT-P/LA-95, 54-SAT-AMEND-96, rel. May 9, 1997), GE American Communications, Inc. (File Nos. 169 through 173-SAT-P/LA-95, 54-SAT-AMEND-97, rel. May 9, 1997), Hughes Communications Galaxy, Inc. (File Nos. 3/4-DSS-P/LA-04, CSS-94-021 through CSS-94-025, 174 through 181-SAT-P/LA-95, 36-SAT-AMEND-96, rel. May 9, 1997), KaStar Satellite Communications Corp. (File Nos. 128-SAT-P/LA-95, 203-SAT-P/LA-95, rel. May 9, 1997), Loral Space & Communications Ltd. (File Nos. 109-SAT-P/LA-95, 110-SAT-P-95, 187-SAT-AMEND-95, 188/189-SAT-P/LA-95, 102/103-SAT-AMEND-96, rel. May 9, 1997), Morning Star Satellite Company, L.L.C. (File Nos. 190 through 193-SAT-P/LA-95, rel. May 9, 1997), NetSat 28 Company, L.L.C. (File No. 184-SAT-P/LA-95, rel. May 9, 1997), Lockheed Martin Corp. (File Nos. 182 through 186-SAT-P/LA-95, rel. May 9, 1997), and VisionStar, Inc. (File No. 200-SAT-P/LA-95, rel. May 9, 1997).

the use of the 3600-3700 MHz band for TT&C operations on two currently pending satellite systems proposals: one that will operate at Ka band, and one that will operate at V band.[5] Furthermore, HCI affiliate Hughes Space and Communications, Inc. is developing additional next generation Ka band and V band satellites for both domestic and international use that use 3650-3700 MHz for TT&C operations. Indeed, given that this band is used extensively by satellite systems internationally, designation of the band to satellite use domestically would have considerable benefits for the global standardization of satellites. In fact, at the suggestion of Commission staff, and in anticipation of favorable action on the TT&C Petition, U.S. satellite companies, including HCI, assisted the Commission in making ITU filings that cover TT&C functions in part of this band for U.S. satellite systems.

Three weeks before the release of the NPRM and Order in this proceeding, the TT&C Petition was placed on Public Notice (Report No. 2306, released November 23, 1998). Since then, all commenters have expressed support for initiating a rulemaking to designate extended C band TT&C spectrum.[6] In view of this broad support, and the absence of any opposition, the record on the TT&C Petition is clear why the Commission should proceed expeditiously with the requested TT&C rulemaking proceeding in the 3600-3700 MHz and 6425-6525 MHz bands.

HCI is gravely concerned about the proposal in the NPRM to reallocate the 3650-3700 MHz band solely for fixed services and the decision to freeze the licensing of earth stations

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[5] *See* Application of HCI for SPACEWAY EXP (filed December 22, 1997); Application of HCI for STARLYNX (filed September 26, 1997).

[6] In addition to HCI, Lockheed Martin Corporation, Loral Space & Communications, Ltd., GE American Communications, Inc., and TRW Inc. have filed in support of the requested rulemaking.

in the band in the interim.[7] The NPRM and Order appears to conflict with the documented need to use this spectrum for satellite TT&C operations, and has not taken any cognizance of the pendency of the 18-month old TT&C Petition, which was still out for public comment while the NPRM and Order in this matter was being released.

As the Commission is well aware, Ka band GSO FSS licensees need to finalize their TT&C designs and proceed with construction of their systems. Part of finalizing their system designs involves making final decisions on TT&C frequencies and subsystems. Thus, HCI urges the Commission to address expeditiously the TT&C needs of the satellite industry in this proceeding.

In this regard, HCI also is concerned about the unwarranted and unsubstantiated earth station licensing freeze that has been imposed, and therefore urges the Commission to reconsider that aspect of the Order. Given that TT&C functions typically are provided from a very limited number of earth stations, there is no basis for thinking that continued licensing of those types of earth stations, in particular, would have any unmanageable, adverse effect on the Commission's terrestrial service proposal, particularly as such facilities, which *receive* signals at 3600-3700 MHz, present no interference threat to any proposed terrestrial user in the 3600-3700 MHz band. Therefore, there is no basis for imposing a wholesale freeze on earth station licensing at 3600-3700 MHz.

The net effect of the Commission's (i) ignoring the pending TT&C Petition, and (ii) freezing any further earth station licensing in this band is to dismiss *sub silento* the critical

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[7] *Amendment of the Commission's Rules with Regard to the 3650-3700 MHz Government Transfer Band*, Notice of Proposed Rulemaking, ET Docket No. 98-237 (rel. Dec. 18, 1998) ("NPRM and Order").

satellite industry issues that have not been challenged by any other interest. Principles of fundamental fairness and administrative due process therefore mandate that the Commission expand the scope of this proceeding to address the needs of the satellite industry and remove the earth station licensing freeze.

HCI therefore urges the Commission to expand the scope of this proceeding to take into account the issues raised in the TT&C Petition. Among other things, it should be possible to develop appropriate criteria that will allow co-frequency sharing with satellite earth stations in general, and with TT&C downlink functions in particular. Thus, a careful examination of the prospects for co-frequency operation must be undertaken. Given the virtually unlimited terrestrial uses that are possible under the current proposal, it is not feasible to conduct such an examination in this Comment cycle.

In conclusion, HCI urges the Commission expand the scope of this NPRM to designate sufficient spectrum at 3600-3700 MHz (space-to-Earth) to accommodate TT&C operations of satellite systems operating in bands other than the C band and Ku band, and to lift the freeze on earth station licensing in the meantime. HCI requests that the Commission conduct this matter on an expedited basis to ensure that current Ka band GSO FSS licensees, in particular, will have access to spectrum in which reliable TT&C operations can be conducted.

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Annex A

STAMP & RETURN

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 2 and 25 of the	)	RM No. _____
Commission's Rules to Designate Extended	)	
C-Band Spectrum for TT&C Functions of GSO	)	
FSS Systems Operating in Bands Above	)	
Ku-band	)	

PETITION FOR RULEMAKING

Comm, Inc., EchoStar Satellite Corporation ("EchoStar"), GE American Communications, Inc. ("GE Americom"), Hughes Communications Galaxy, Inc. ("Hughes"), KaStar Satellite Communications Corp. ("KaStar"), Lockheed Martin Corporation ("Lockheed Martin"), Orion Network Systems, Inc. ("Orion"), PanAmSat Licensee Corp. ("PanAmSat"), and VisionStar, Inc., pursuant to Section 1.401 of the Commission's rules, hereby petition the Commission to designate 10 MHz of spectrum in both the 3600-3700 MHz band (space-to-Earth) and the 6425-6525 MHz band (Earth-to-space) for tracking, telemetry, and control ("TT&C") operations for geostationary satellite orbit ("GSO") space stations in the fixed-satellite service ("FSS") which operate at bands above Ku-band.

Introduction

On May 9, 1997, the Commission granted licenses to 13 companies, including all of the Petitioners, for 73 satellites to provide GSO FSS services in the Ka-band (or "30/20 GHz" bands). These systems represent billions of dollars of investment and will provide a wide range of broadband satellite communications services as a critical element of the Global Information Infrastructure ("GII").

Like all spacecraft, these Ka-band satellites require proven and reliable TT&C capabilities for orbital insertion, station-keeping and on-orbit maneuvers, and other spacecraft housekeeping functions. Dependable TT&C is crucial to maintain normal spacecraft operations and to recover from anomalous spacecraft events in emergency situations. Petitioners believe that the Commission should authorize GSO FSS systems operating service links in higher frequencies such as the 30/20 GHz bands to perform these critical spacecraft operations in bands which can utilize proven TT&C technology and equipment.[1/] Specifically, Petitioners respectfully request that the Commission designate 10 MHz of extended C-band spectrum in the 3600-3700 MHz band (space-to-Earth) and 6425-6525 MHz band (Earth-to-space) for TT&C operations for GSO FSS systems operating in higher frequency bands (*i.e.*, above Ku-band).[2/]

Discussion

On May 9, 1997, the Commission licensed 13 companies, including all of the Petitioners, to launch and operate 73 GSO FSS satellites in the 30/20 GHz band. The Ka-band licensees generally proposed to perform on-orbit TT&C operations in the Ka-band and transfer orbit or secondary TT&C in the C-band or Ku-band.[3/] Although the Commission did not address the

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1/ Existing GSO FSS systems operating in the C-band and Ku-band have demonstrated the feasibility of performing TT&C operations within their service bands. Accordingly, this petition for rulemaking is limited to the TT&C operations of GSO FSS systems operating in bands above Ku-band, such as the Ka-band.

2/ The Commission may also wish to consider a similar designation in extended Ku-band frequencies to permit satellite operators to take advantage of existing global Ku-band facilities. However, this petition only requests an extended C-band designation.

3/ Many Ka-band licensees proposed on-orbit TT&C operations in their service bands based on an extremely narrow interpretation of Section 25.202(g) of the Commission's rules. However, as discussed below, this provision very likely permits GSO FSS TT&C operations in any frequency band allocated to FSS.

issue of on-orbit TT&C, it uniformly rejected proposals to use C-band or Ku-band frequencies for transfer orbit TT&C because such spectrum is not allocated to the Space Operations Service nor are these bands included in the systems' service bands.[4/]

Section 25.202(g) of the Commission's rules provides that "[t]elemetry, tracking and telecommand functions for U.S. domestic satellites shall be conducted at either or both edges of the *allocated* band(s)."[5/] Although the Commission apparently interpreted this provision to require TT&C to be performed in a system's service bands or in bands allocated to space operations, the ITU has interpreted this type of regulation more broadly to permit TT&C operations in any band allocated to the *same service* as the service links (*e.g.*, a Ka-band FSS system may use C-band FSS frequencies for TT&C).[6/] In addition, the Commission has previously authorized TT&C

4/ *See* Ka-band authorizations of Comm, Inc. (File Nos. 163 through 166-SAT-P/LA-95, 201-SAT-MISC-95, rel. May 9, 1997), EchoStar Satellite Corp. (File Nos. 167 and 168-SAT-P/LA-95, 54-SAT-AMEND-96, rel. May 9, 1997), GE American Communications, Inc. (File Nos. 169 through 173-SAT-P/LA-95, 54-SAT-AMEND-97, rel. May 9, 1997), Hughes Communications Galaxy, Inc. (File Nos. 3/4-DSS-P/LA-94, CSS-94-021 through CSS-94-025, 174 through 181-SAT-P/LA-95, 36-SAT-AMEND-96, rel. May 9, 1997), KaStar Satellite Communications Corp. (File Nos. 128-SAT-P/LA-95, 203-SAT-P/LA-95, rel. May 9, 1997), Loral Space & Communications Ltd. (File Nos. 109-SAT-P/LA-95, 110-SAT-P-95, 187-SAT-AMEND-95, 188/189-SAT-P/LA-95, 102/103-SAT-AMEND-96, rel. May 9, 1997), Morning Star Satellite Company, L.L.C. (File Nos. 190 through 193-SAT-P/LA-95, rel. May 9, 1997), NetSat 28 Company, L.L.C. (File No. 184-SAT-P/LA-95, rel. May 9, 1997), Lockheed Martin Corp. (File Nos. 182 through 186-SAT-P/LA-95, rel. May 9, 1997), and VisionStar, Inc. (File No. 200-SAT-P/LA-95, rel. May 9, 1997).

5/ 47 CFR § 25.202(g) (1996) (emphasis added).

6/ The ITU Rule of Procedure on Radio Regulation 25 provides:

> . . . space operation functions will be considered in conformity with the Table of Frequency Allocations (favorable Finding) in the case where the assigned frequency (and the assigned frequency band) lies in a frequency band allocated to the:

operations in frequencies outside of the system's service links and space operations spectrum in certain circumstances.[7/] Accordingly, Petitioners believe that designation of extended C-band FSS spectrum for TT&C operations of GSO FSS satellites operating in higher frequencies such as the Ka-band is consistent with Section 25.202(g). However, if the Commission concludes that Section 25.202(g) does not permit the use of TT&C frequencies outside of a system's service band or bands allocated to space operations, then Petitioners urge the Commission to amend Section 25.202(g) in the context of this rulemaking.

The designation of appropriate spectrum for TT&C operations is critical to facilitate the deployment of GSO FSS systems in the Ka-band and in higher frequencies. Although it may be technically feasible to perform TT&C operations in the 30/20 GHz bands and in higher frequencies, such a requirement would place substantial operational constraints on these next-generation satellite systems. For example, the use of Ka-band or higher frequencies for TT&C would require the use of non-standard equipment, specially-designed high-power Ka-band amplifiers, and significantly larger ground antennas to achieve the required reliability. Use of such equipment will result in substantial technical and operational difficulties, which indicates that frequencies above Ku-band are not technically or economically suitable for TT&C operations of GSO FSS satellites operating in significantly higher frequency bands.

— Space Operation Service, or
— *the main service in which the space station is operating (e.g., FSS, BSS, MSS).*

ITU Rules of Procedure (1994) Part A1 at 1 (emphasis added).

7/ *See, e.g.*, *DirectSat Corp.*, Order, File No. 53-SAT-ML-95, DA 96-1514 (rel. Sept. 9, 1996).

Since the TT&C spectrum requirements of GSO FSS systems are extremely modest (usually below 1 MHz per system) and sharing among GSO FSS systems should be easily achieved, the amount of spectrum requested in the instant petition is very small. Petitioners estimate that the designation of 10 MHz of spectrum in each direction for TT&C operations will be sufficient to meet the needs of the GSO FSS systems operating in the Ka-band and higher frequencies for the foreseeable future. The proposed 10 MHz would be used for transfer orbit TT&C, standard on-orbit TT&C functions, and emergency-mode TT&C.

Petitioners believe that the most promising C-band spectrum for TT&C operations of GSO FSS systems is the extended C-band frequencies at 3600-3700 MHz (space-to-Earth) and 6425-6525 MHz (Earth-to-space). These bands are particularly attractive because they are adjacent to traditional C-band FSS frequencies, which will permit the use of extremely reliable and widely available equipment to satisfy the TT&C requirements of Ka-band systems and higher frequency GSO FSS satellites.

The 3600-3700 MHz band (space-to-Earth) is already allocated on a primary basis to FSS for non-government use and aeronautical radionavigation and radiolocation for government use.[8/] Although use of the 3600-3700 MHz band would require compliance with Footnote US245, which could be construed to limit FSS use of the band to international inter-continental systems, Petitioners urge the Commission to clarify or waive Footnote US245 with respect to the TT&C

8/ *See* 47 CFR § 2.106 (1996). Of course, GSO FSS systems seeking to perform TT&C operations in this band would be required to coordinate with affected government and non-government users.

operations of GSO FSS systems in the 3600-3700 MHz band.[9] The intent of Footnote US245 is to limit the number of FSS earth stations in the 3600-3700 MHz band by restricting the use of that spectrum to *service links* of international intercontinental systems. Accordingly, the use of 10 MHz of spectrum within this band by a small number of TT&C facilities is consistent with the intent of Footnote US245. Such a clarification or, if the Commission deems it necessary, a waiver of Footnote US245 would permit domestic and sub-regional GSO FSS satellite systems operating in bands above Ku-band to obtain the benefit of the Commission's designation of extended C-band spectrum for TT&C operations.[10]

The 6425-6525 MHz band (Earth-to-space) is also allocated on a primary basis to non-government FSS use, as well as to non-government mobile services. Services which may utilize this band include broadcast auxiliary services, cable television relay, domestic public fixed radio services, and private operational-fixed microwave. Use of the 6425-6525 MHz band does not appear to be extensive and coordination with these services should be possible. In addition, the Commission should be able to develop rules governing these services and GSO FSS TT&C operations in the small amount of spectrum requested in order to reduce the number of coordinations required. Thus, the 6425-6525 MHz band is promising spectrum in which to designate 10 MHz of uplink spectrum for the proposed GSO FSS TT&C operations.

9/ Footnote US245 also requires a case-by-case electromagnetic compatibility ("EMC") analysis, which would be performed on a system-by-system basis.

10/ Indeed, the Commission has previously authorized the modification of a satellite operator's license to permit operation on a non-conforming basis with Footnote US245. *See DirectSat Corp.*, *supra* note 7. Of course, satellite operators proposing to implement international inter-continental GSO FSS systems in bands above Ku-band would satisfy Footnote US245.

Conclusion

Petitioners respectfully request that the Commission institute a rulemaking proceeding to designate 10 MHz of spectrum in each of the 3600-3700 MHz band (space-to-Earth) and 6425-6525 MHz band (Earth-to-space) for TT&C operations of GSO FSS systems operating in bands above Ku-band. Further, in light of the impact of TT&C frequencies on the construction milestones of newly-licensed Ka-band satellite systems, Petitioners request that the Commission consider this rulemaking on an expedited basis.

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